Fertilizing

Ample nutrients are vital to growing healthy plants, but did you know that *too much* fertilizer can make plants vulnerable to pests, diseases, drought, and winter damage? Excess fertilizer use can also pollute local lakes and streams. Proper fertilizing keeps plants healthy, reduces lawn and garden maintenance, and protects clean water for fish and people. The keys to feeding plants what they need for healthy growth are:

- **Fertilize moderately, based on plant needs.**
- **Use organic or slow release fertilizers that don't wash into streams.**
- **Test soil for annuals and lawns occasionally to find out if fertilizer is needed.**

Fertilize Moderately Based on Plant Needs

The ideal type and amount of fertilizer to apply in a garden depends on the plants and soil. Vegetables and annual flowers need regular fertilization for optimal growth, but most established trees and shrubs thrive with just the nutrients in the soil and mulches. The nutrients available in any soil—and from added fertilizers—depends on whether it is sand, or clay, the amount of decaying plant and animal wastes present, acidity, and other factors.

Soil tests by a professional laboratory can adjust fertilizer rates for these factors, but the amounts listed in the chart on the following page provide useful guidelines.

Use Organic or Slow Release Fertilizers

Much of the nutrients in "quick release" fertilizers may be washed out of soil by rain or irrigation—wasting money and contaminating streams, lakes, or groundwater. Slow release and organic fertilizers gradually discharge nutrients, providing plants a steady supply for healthy growth. Slow release fertilizers may cost more than quick forms, but are a better value since more of the nutrients actually feed plants and they do not need to be applied as often.

City of Bellevue Utilities
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Quick Guide to Responsible Fertilizing

	Lawns	Annual Gardens	Trees and Shrubs
When?	September best, May as needed. Early summer if needed.	At planting. A few weeks after planting, especailly in cool weather. As needed for repeat flowering or harvesting.	At planting. In spring if plants are stunted or show signs of need.
Best Fertilizer	Lawn fertilizers with 3-1-2 ratio (eg. 6-2-4, 18-6-12). Lime in sandy soil every 2 years; in clay soil every 3 years. Do not use "Weed and Feed" type products. Spot spray weeds that cannot be pulled.	Balanced fertilizers such as 10-10-10 or Alfalfa Meal (3-2-2). Liquid fertilizers like fish emulsion to spur growth in cool conditions. Lime in sandy soil every 2 years; in clay soil every 3 years.	Mulch and compost amendment at planting provides adequate nutrients. Any added fertilizer should be based on testing. Fruit trees may benefit from extra fertilizer, though compost and mulch should supply enough.
			
How to Apply	Calibrated lawn fertilizer spreader. Leave clippings on lawn to recycle nutrients.	Mix into soil before transplanting or seeding. Scratch into soil along plant rows. Apply liquid fertilizer to soil around plants.	Mix with soil used to fill planting holes. Scratch into soil under branch tips, or spread on surface and cover with mulch.
How Much?	One pound of nitrogen each application per 1000 square feet.	Follow product label or soil test results.	Follow soil test results.

(shown, left to right): **lawn spreader; scratched along rows; spread on surface.**

Look for the words "organic" or "slow release" on the fertilizer bag.

"Organic" fertilizers include minerals like rock phosphate, crop residues such as alfalfa and cottonseed meals, and animal wastes like poultry manure and fish meal. Most nutrients in these fertilizers must be digested by bacteria before plants can use them. They are slowly released when warm soil stimulates bacterial activity, and growing plants need them.

"Quick release" fertilizers (also called "water-soluble") like urea and ammonium sulfate are derived from natural gas, using large inputs of energy. They quickly dissolve in water and are often washed out of the soil by rain or irrigation before they can be used by plants.

"Slow release" fertilizers such as sulfur coated urea contain non-organic quick release nutrients encased in protective coatings that must be dissolved by water to release the nutrients over a period of weeks or months.

Avoid fertilizer-pesticide combination products. Fertilizers and mulches combined with weed or insect killers are not recommended.

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Test Soil to Find Out How Much Fertilizer is Needed

Soil tests help to make sure you use only the fertilizers plants need and can help diagnose plant growth problems. Regular use of fertilizers does not guarantee healthy plants. Many plant problems are unrelated to nutrient needs, and sometimes nutrients are adequate but plants cannot use them due to imbalances. Annual soil testing is *not necessary* in most home gardens. However, it is useful to test before planting new garden areas, and to retest annual gardens and lawns every few years to ensure efficient fertilization.

Who: Send soil samples to a laboratory familiar with local soils. Lists of certified test services are available from the King Conservation District, Garden Hotline, and WSU King County Extension (see the Resources listings on back). Call or check out the laboratory website before sending a sample. Make sure you provide enough soil and use their forms for specifying test packages.

When to test: Test the soil in spring or summer—as close as possible to planned fertilization or liming. Test after making large compost applications, to take account of the nutrients added.

Where to check: Test soil for each planting type separately: Lawn, annual garden, perennials, fruits, deciduous trees and shrubs, and evergreens. Conduct separate tests for areas with different soil textures (sand, clay or silt), or persistent plant problems.

How to gather samples: Each sample should be a mix of soil from several spots within the garden area to be tested.

- Dig an 8-10 inch deep hole in each spot. Shave a 1 inch thick slice of soil from the side of each hole for the sample. In lawn areas, remove grass and surface root mat or thatch buildup from the slices. In planting beds, remove any mulch layer.
- Mix the samples from each hole together in a clean bucket.
- Put 2 cups (or more if lab requires) of the mix into a plastic bag labeled with your name and address, and the type of plants to be grown in the area.

WHAT DO THOSE NUMBERS MEAN?

Soil test reports typically recommend how many pounds of a *nutrient* (Nitrogen, Phosphorous, etc.) is needed per 100 or 1000 square feet—but how do you know how much *fertilizer* to apply?

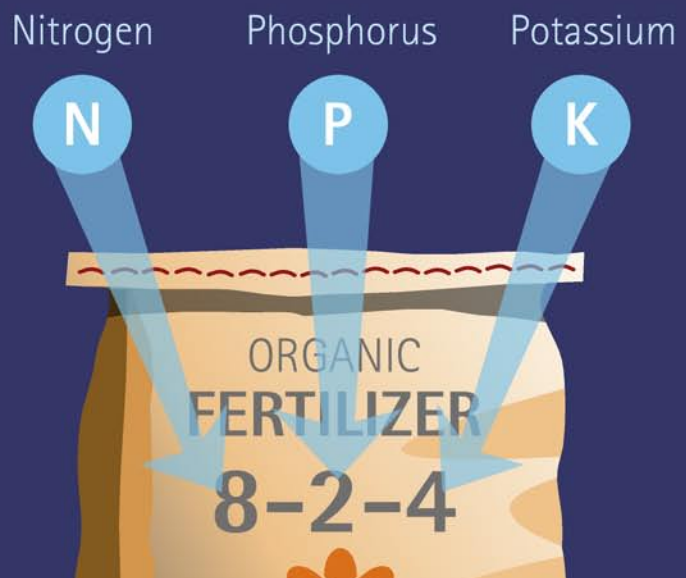
The following example shows how to figure out how many pounds of a fertilizer are needed to supply a recommended amount of nutrient.

Recommendation: Apply 2 pounds of nitrogen per 1,000 square feet.

Fertilizer: "8:2:4" Organic Lawn Fertilizer

Determine the Product Nutrient Content: The three numbers on front of the fertilizer package shown below indicate it contains 8% Nitrogen, 2% Phosphorous and 4% Potassium. To calculate how many pounds of fertilizer are needed to supply one pound of nitrogen: Divide the percentage of the nutrient in the fertilizer into 100. For example 100 / 8 = 12.5 pounds of fertilizer needed to supply 1 pound of nitrogen.

Calculate how many pounds to use: Multiply this answer by 2 to determine that you need 25 pounds of fertilizer per 1,000 feet to supply 2 pounds of nitrogen.



WHAT ABOUT HOME GARDEN TEST KITS?

There are many kits available to test soil for major nutrients and acidity. These kits are interesting for monitoring nutrient changes, but provide an incomplete picture of a complex system. Professional laboratories should be used to evaluate soil before planting new gardens, manage large areas, or solve persistent plant problems.

What to Test For: Many soil labs offer inexpensive "home garden" packages that include all the tests needed to recommend amendments and fertilizers. At a minimum, tests should include:

Soil texture: The mix of sand, silt, and clay affects fertilization need and frequency.

pH (acidity): Soil acidity affects nutrient availability and need for limestone.

Major Nutrients: Nitrogen, phosphorous, potassium, calcium, and magnesium are the most important plant nutrients. Some labs include sodium or sulfur.

Minor Nutrients: Elements plants need in smaller amounts; such as boron, iron, and manganese.

Organic Matter: Amount of decomposing plant and animal waste in soil affects nutrient availability and beneficial soil life.

RESOURCES

Bellevue's Natural Lawn and Garden website
www.bellevuewa.gov/natural_lawn_intro.htm

Bellevue's *Natural Gardening Guides*
Composting Food Scraps • *Composting Yard Trimmings* • *Drip and Soak* • *Fertilizer* • *Garden Design* • *Lawn Alternatives* • *Lawns* • *Mulch* • *Pests, Weeds, and Diseases* • *Plant Right* • *Seasonal Calendar* • *Soil* • *Watering*
For copies, visit Bellevue's Natural Lawn and Garden website *(above)* or call Bellevue Utilities at 425-452-6932.

WSU King County Extension Gardening Factsheet #6—Soil Testing and Soil Improvements
http://king.wsu.edu/gardening/documents/6SoilTestingandSoilImprovement_000.pdf

King Conservation District—Soil Testing Service
www.kingcd.org or 425-282-1905

The Garden Hotline
www.gardenhotline.org or 206-633-0224

Natural Yard Care Neighborhoods
www.naturalyardcare.info

Heavy Metals: Urban soils and old fruit orchards can contain unhealthy levels of lead, cadmium, and arsenic that need to be removed or covered with clean soil to be safe for growing food.

Fertilizer and Lime Recommendations: Most labs include fertilizer recommendations for one planting type per test. Be sure to specify plant type and if you only want to use organic fertilizers.

CITY OF BELLEVUE WASHINGTON

Local Hazardous Waste Management Program in King County, Washington

Brought to you by the City of Bellevue with funding from the Local Hazardous Waste Management Program of King County

Alternate formats available: Voice 425-452-6800 or TTY relay: 711.

Printed on 100% post-consumer recycled-content paper.
2/2011